A Dissertation on

A COMPARATIVE STUDY OF CORTICAL MASTOIDECTOMY WITH MYRINGOPLASTY VS MYRINGOPLASTY ALONE IN ACTIVE CASES OF CHRONIC OTITIS MEDIA

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DECLARATION

I, **DR. SIDDARTHAN.M**, Solemnly declare that the dissertation, titled **"A COMPARATIVE STUDY OF CORTICAL MASTOIDECTOMY WITH MYRINGOPLASTY VS MYRINGOPLASTY ALONE IN ACTIVE CASES OF CHRONIC OTITIS MEDIA"**

Is a bonafide work done by me during the period of JANUARY 2012 to SEPTEMBER 2013 at Government Stanley Medical College and Hospital, Chennai under the expert supervision of **PROF.DR.M.RAMANI RAJ, M.S., D.L.O.,** Professor Department Of Otorhinolaryngology, Government Stanley Medical College and hospitals, Chennai.

This dissertation is submitted to The Tamil Nadu Dr. M.G.R. Medical University in partial fulfilment of the rules and regulations for the M.S. degree examinations in Otorhinolaryngology to be held in April 2014.

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Date:

CERTIFICATE

This is to certify that this dissertation on "**A COMPARATIVE STUDY OF CORTICAL MASTOIDECTOMY WITH MYRINGOPLASTY VS MYRINGOPLASTY ALONE IN ACTIVE CASES OF CHRONIC OTITIS MEDIA"**

Presented here in by DR SIDDARTHAN.M, is the original work done in Department of Otorhinolaryngology, Government Stanley Medical College and Hospitals, Chennai in partial fulfillment of the regulations of the Tamilnadu DR.M.G.R Medical University, Chennai for the award of M.S (Otorhinolaryngology), under guidance and supervision during the academic year 2011 – 2014.

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CONTENTS

ABSTRACT

This is a study about usefulness of cortical mastoidectomy in addition to myringoplasty for the treatment of active cases of chronic otitis media mucosal type , conducted in a tertiary care center between JAN 2012 to SEP 2013.

About 60 patients were selected and out of which 30 patients were treated with cortical mastoidectomy with myringoplasty , in another 30 patients myringoplasty alone was done.

Post operative results were compared at 2months , 6months and at 1 year in terms of graft uptake, recurrence of disease and hearing improvement . And the results showed that cortical mastoidectomy had no added advantage over myringoplasty in treating active cases of chronic otitis media –mucosal type.

INTRODUCTION

Chronic otitis media is a chronic inflammation of the middle ear and mastoid cavity which presents with persistant ear discharge through a tympanic membrane perforation, for a period of more than 3 months.

Prevalence surveys show that the global burden of illness from chronic otitis media involves 100-300 million individuals with active ear discharge. 58 % of whom suffer from significant hearing loss. And a disease burden of 2.1 million of DALY. Over 85% of the burden is seen in developing nations.

To improve the hearing, to make the discharging ear dry and to prevent the recurrence of disease two surgical procedures, cortical mastoidecmy with type 1 tympanoplasty and myringoplasty are offered by otologists .

This study, conducted at department of ENT, Stanley medical college, discusses the effectiveness of these two surgical procedures in terms of hearing improvement, graft uptake, recurrence in carefully selected patients in active cases of chronic otitis media tubotympanic type of these two surgical procedures in terms of hearing improvement, graft uptake, recurrence in carefully selected patients in active cases of chronic otitis media tubotympanic type.

AIM OF STUDY

To compare the efficacy of two surgical procedures , cortical mastoidectomy with type 1 tympanoplasty and myringoplasty alone ,in active cases of tubotympanic type of chronic otitis media.

REVIEW OF LITERATURE

DEVELOPMENT OF THE EAR

The human ear development begins at the fourth week of embryonic life.

EXTERNAL EAR

The auricle develops from auricular hillocks, derived from first and second branchial arches. The six hillocks develop in the 6-week of embryonic life. The external auditory meatus formed by deepening of the groove between the two arches.

At the dorsal end of the first branchial groove, the ectodermal cells thicken and form the external meatus. These ectodermal cells proliferation forms a meatal “plug” that progress medially. Resorption of cells in the center of this meatal plug forms a tube-like structure which becomes ear canal. When complete canalization fails to occur that leads to External canal atresia.

MIDDLE EAR

The middle ear cavity forms as a lateral extension of the first pharyngeal pouch. The proximal end of this extension becomes the

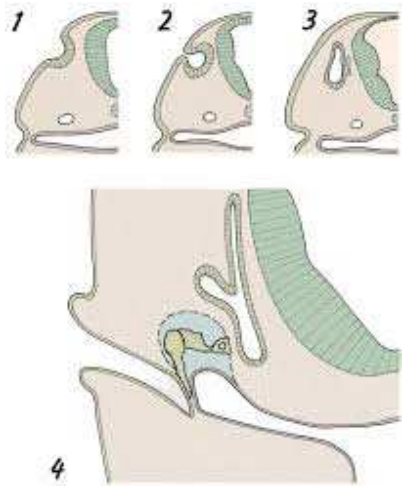
eustachian tube. The lateral extension joins with the ectoderm of the meatal plug and forms the tympanic membrane.

From Mesoderm of the first branchial arch, the malleus, incus, anterior malleolar ligaments and tensor tympani muscle are derived. From the mesoderm of second arch, Stapes, stapedius muscle derived .

INNER EAR

It has two components,

1. Membranous labyrinth. -derived from the ectoderm
2. Bony labyrinth- derived from the mesoderm and neural crest



1. Oticplacode
2. Otic cup
3. Otic cyst
4. Inner ear

The membranous labyrinth develops from the otic placode which is a thickening of the ectoderm adjacent to the hindbrain. This otic placode invaginates and forms an otic cup. By the end of the fourth week, the edges of the otic cup fuse together form the otic vesicle/otocyst. A few of otic epithelial cells in the otic cup and otocyst separates from the epithelium and joins to form neurons of the eighth cranial nerve. These neurons innervate sensory organs within the inner ear.

A diverticulum develops in the otocyst elongates to form the endolymphatic duct and sac. The remaining portion of the otocyst enlarges and forms a ventral saccular and cochlear region, and the dorsal region develops into the utricle and three semicircular ducts.

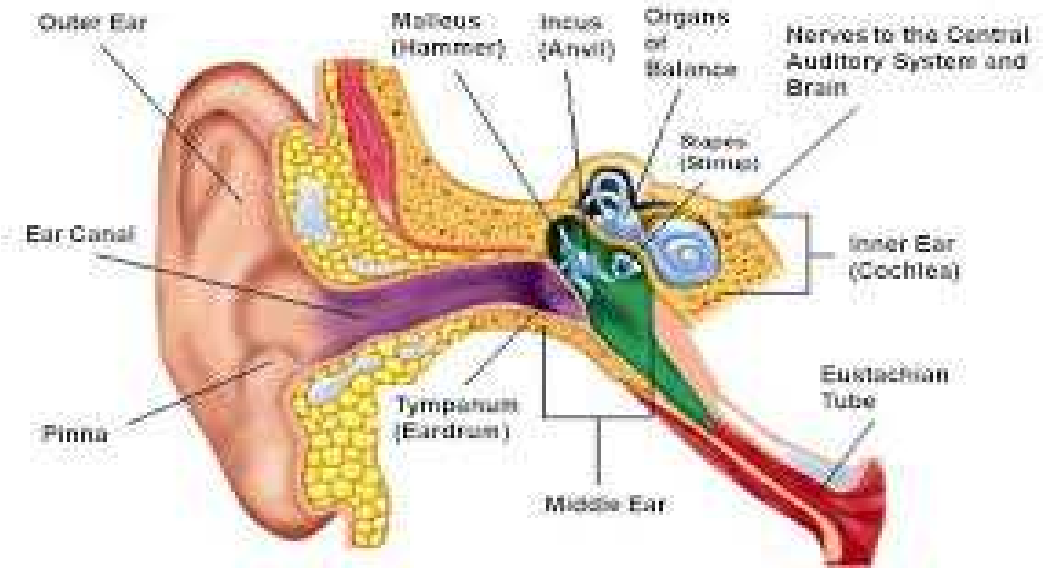
The superior and posterior semicircular canals develop from a vertical outgrowth in the dorsal region of the otocyst. The lateral duct develops from a horizontal outgrowth in the lateral portion of the otocyst.

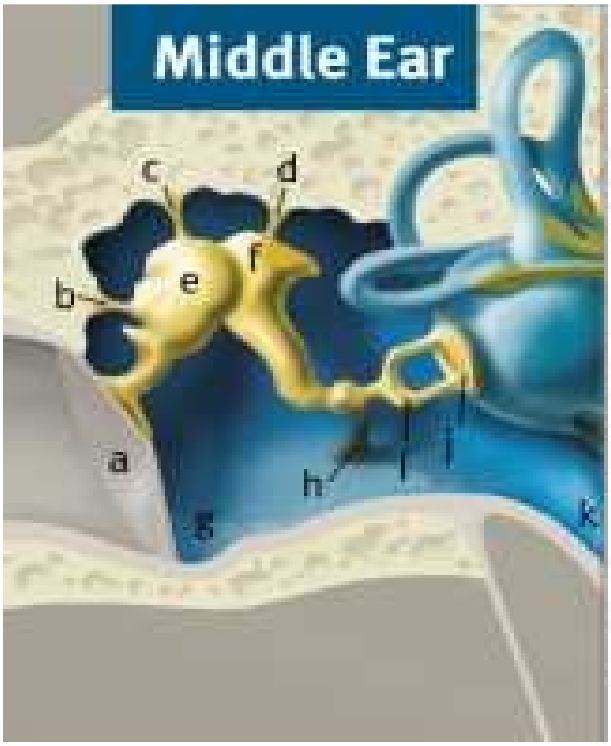
THE EXTERNAL AUDITORY CANAL:

NORMAL ANATOMY:

The external auditory canal is approximately 2.5 cm in length and serves as a channel for sound transmission to the middle ear. Its lateral one-third is bolstered by elastic cartilage oriented in an upward and backward fashion; its anterior aspect is pierced by vertical fissures known as the fissure of Santorini. These fissures are a potential route for spread of infections or neoplasms between the external auditory canal and the parotid gland.

The medial two-thirds of the external auditory canal is osseous and is oriented in a downward and forward direction. Hence the auricle must be pulled upward and posteriorly to achieve alignment during otoscopic examination. The narrowest portion of the external auditory canal or isthmus is located just medial to the junction of the bony and fibrocartilagenous canal.





a) Eardrum

b) Lateral malleolar ligament

c) Upper malleolar ligament

d) Incudal ligament

e) Malleus

f) Incus

g) Middle ear

h) Stapedius muscle

i) Stapes

j) Stapes footplate and oval window

k) Eustachian tube

THE TYMPANIC MEMBRANE

The tympanic membrane is irregularly round and slightly conical in shape. The apex of the cone is located at the umbo, which marks the tip of the manubrium. In the adult, it is angulated approximately 140° with respect to the superior wall of the external auditory canal. The vertical diameter of the tympanic membrane as determined along the axis of the manubrium ranges from 8.5 to 10 mm, while the horizontal diameter varies from 8 to 9 mm.

The anterior and posterior tympanic striae extend from the lateral process of the malleus to the anterior and posterior tympanic spines, respectively. These striae divide the tympanic membrane into larger pars tensa below, and smaller triangular pars flaccida (or Shrapnell's membrane) above.

The thickened periphery of the pars tensa , the tympanic annulus anchors the tympanic membrane in a groove known as the tympanic sulcus. The tympanic annulus and sulcus are absent superiorly in the area of the notch of Rivinus.

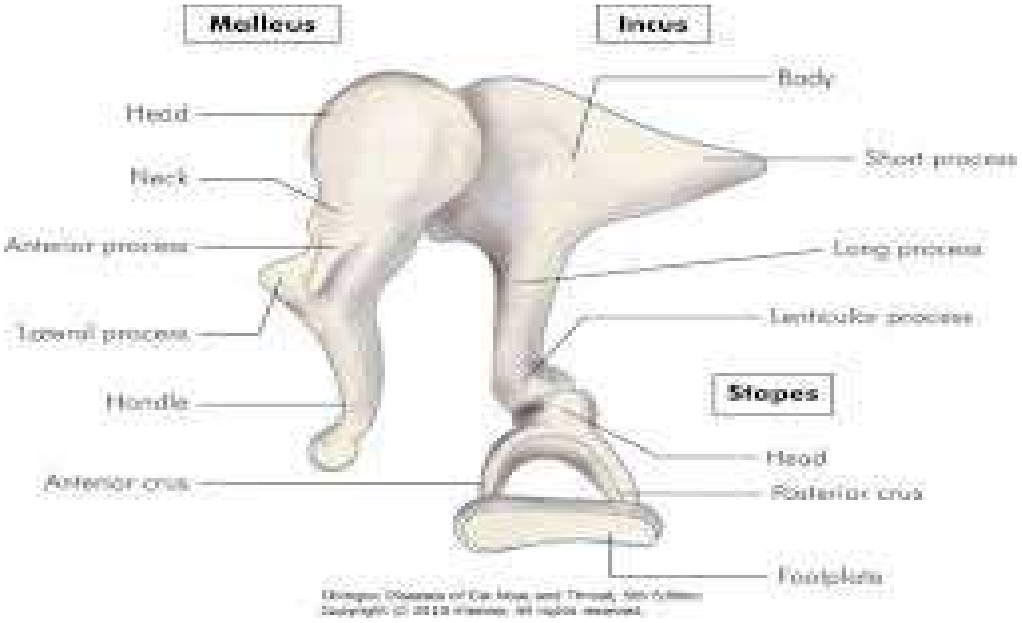
The pars tensa, as its name suggests, is taut and consists of three layers:

- . A lateral epidermal layer
- . A medial mucosal layer
- . An intermediate fibrous layer.

The pars flaccida, first described by Shrapnell, also consists of epidermal, fibrous, and mucosal layers. Here, the fibrous layer is scanty and consists of irregularly arranged collagen and elastic fibers.

THE OSSICLES:

The three ossicles (malleus, incus, stapes) serve to transmit sound energy from the tympanic membrane to the inner ear.



THE MALLEUS:

It has a head, neck, lateral process, anterior process, and manubrium.

It is held to the walls of the petrotympanic fissure by the anterior malleal ligament which, with the posterior incudal ligament, serves to establish the axis of rotation of the ossicles. On its thinner, medial aspect runs the chorda tympani nerve as it passes anteriorly to enter the iter chordae anterius at the Glaserian fissure.

The lateral process of the malleus contains a cartilaginous cap attached to the pars tensa of the tympanic membrane. The inferior end of the manubrium is firmly attached to the tympanic membrane as the pars propria splits to envelop it (the umbo).

The malleus is held in place by five ligaments, one articulation, the tensor tympani tendon, and the tympanic membrane.

Three of the five ligaments have a suspensory function. They are:

- The anterior suspensory ligament
- . The lateral suspensory ligament
- . The superior suspensory ligament

THE INCUS:

The incus, the largest of the auditory ossicles, consists of a body, short process, long process, and lenticular process. The body of the incus rests in the epitympanum in association with the head of the malleus.

The short process of the incus extends posteriorly, occupying the posterior incudal recess (fossa incudis).The long process reaches inferiorly, to end in the lenticular process; the convex surface of this process articulates with the concave surface of the head of the stapes.

The long process of the incus is highly susceptible to osteitic resorption caused by chronic otitis media.

THE STAPES:

The stapes is the smallest ossicle. It consists of a head, footplate (the basis stapedis), and two crura or legs. The stapedius tendon attached to the superior aspect of the posterior crus.

The footplate, in association with the annular ligament, seals the oval Window. The head articulates with the lenticular process of the incus at its fovea.

THE MUSCLES

THE STAPEDIUS MUSCLE:

The stapedius muscle, the smallest of the skeletal muscles, emerges from the pyramidal eminence and attaches to the head and/or posterior crus of the stapes. It is supplied by facial nerve.

THE TENSOR TYMPANI MUSCLE:

The tensor tympani muscle, arises from the cartilage of the eustachian tube, attach to the concave surface of the cochleariform (spoon-shaped) process, at which point the main body of the tendon turns laterally to attach to the medial and anterior surfaces of the neck and the manubrium of the malleus. Its innervation is from the trigeminal nerve . The action of the

tensor tympani muscle is to draw the manubrium medially, thus tensing the tympanic membrane.

THE MIDDLE EAR SPACES:

The tympanic cavity is a cleft in the sagittal plane measuring about 15 mm in the vertical and anteroposterior dimensions.

In its transverse dimension, it expands superiorly to 6 mm and inferiorly to 4 mm from a central constriction of 2 mm.

At the floor of the tympanic cavity (jugular wall) a small plate of bone separates the jugular bulb.

In the posterior wall, the chordal eminence is lateral to the pyramidal eminence and medial to the posterior rim of the tympanic membrane. There is a foramen in this eminence, known as the iter chordae posterius , through which the chorda tympani nerve gains access to the middle ear.

The facial recess is interposed between the chordal eminence laterally and the pyramidal eminence medially and superiorly bounded by the fossa incudis.

The sinus tympani lies between the ponticulus (which bridges the gap between the pyramidal eminence and the promontory superiorly,) and the subiculum .

The anterior wall of the middle ear (carotid wall) narrows inferiorly where it is formed by the thin bony shell of the carotid canal. Located more superiorly in the anterior wall is the orifice of the eustachian tube and above it the tensor tympani muscle lies in its semicanal.

The roof (tegmental wall, tegmen tympani) separates the tympanic cavity from the middle cranial fossa.

The lateral boundary (membranous wall) is composed of the tympanic membrane, the bony tympanic ring, and a layer of bone from the squama - the scutum or shield of Leidy.

The medial wall (labyrinthine wall) of the tympanic cavity is marked by two main depressions :

- The round window niche
- The oval window niche.

The round window niche is located anteroinferior to the subiculum and posteroinferior to the promontory.The latter structure is the bulge of the bone overlying the basal turn of the cochlea.

The oval window niche is anterosuperior to the ponticulus . Located posterosuperiorly is the prominence of the facial canal as it traverses the

medial wall and then descends along the mastoid wall of the tympanic cavity.

The middle ear space is divided into four regions:

- The mesotympanum (middle ear proper) is that area located medial to the tympanic membrane and the bony tympanic annulus.
- . The epitympanum is that area that lies medial to the pars flaccida and scutum.
- . The protympanum lies anterior to a frontal plane drawn through to the anterior margin of the tympanic annulus. It leads to the tympanic orifice of the eustachian tube.
- The hypotympanum is that part of the middle ear located inferior to a horizontal plane through the most inferior part of the tympanic annulus.

THE EUSTACHIAN TUBE:

The eustachian tube, a mucosally lined pathway between the nasopharynx and the middle ear, permits ventilation of the pneumatized spaces of the temporal bone while safeguarding against bacterial contamination of these spaces. The posterolateral one-third is bony while the anteromedial two-thirds is fibrocartilaginous; these two sections are joined at the tubal isthmus. The overall length of the eustachian tube in the adult is 36mm.

THE MIDDLE EAR MUCOSA:

In electron microscopic observations, Hentzer distinguished five types of cells in the middle ear mucosa:

- . Nonciliated without secretory granules
- . Nonciliated with secretory granules
- . Ciliated
- . Intermediate
- . Basal

The mucosa of the middle ear represents a modified respiratory mucosa.

THE MASTOID REGION:

At birth the mastoid has a single cavity consisting of the antrum and small adjacent mastoid.It occupies a superficial position and is surrounded by diploic bone.

In adult life, the normal mastoid may be fully pneumatized, diploic, or sclerotic. The anterolateral portion of the mastoid arises from the squamous part of the temporal bone; the posteromedial portion, including the mastoid tip, arises from the petrous part.

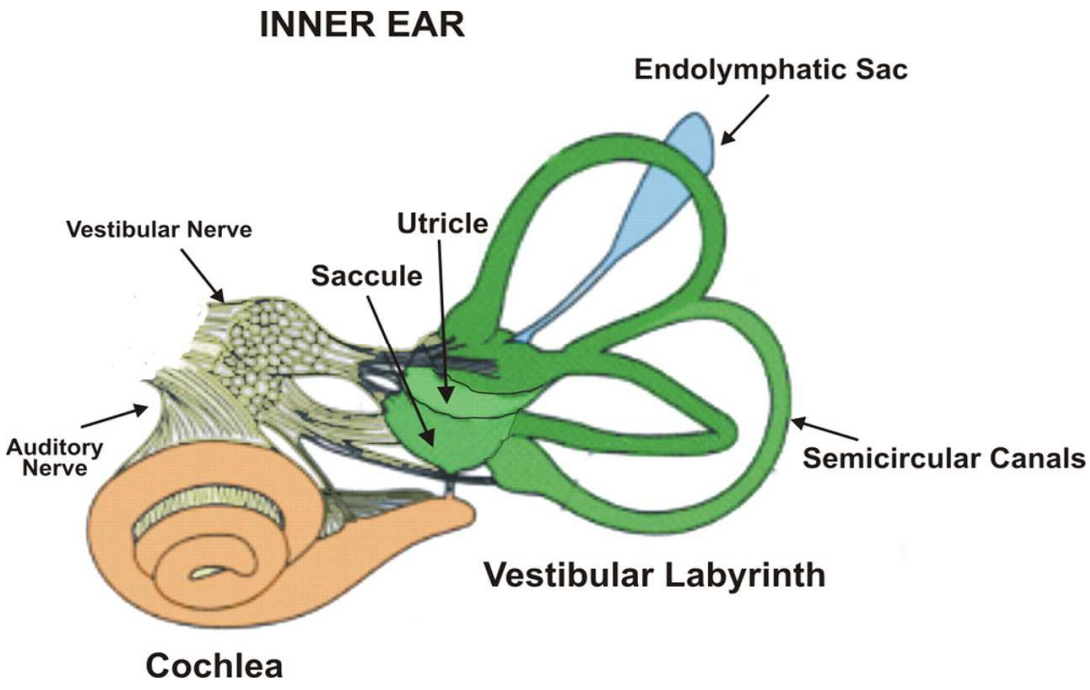
In most mastoids, the plane of junction of these two parts is marked internally by an incomplete plate of bone, the petrosquamosal septum, also known as Koerner's septum. The mastoid antrum area is a large superior central space which communicates with the epitympanic space of the middle ear via the aditus.

THE INNER EAR

THE BONY LABYRINTH:

The long axis of the bony labyrinth, measuring 20 mm in length, roughly parallels the posterior surface of the petrous pyramid.

Its components are the vestibule, the semicircular canals, and the cochlea.



THE VESTIBULE:

The vestibule is the central chamber. At the posterosuperior aspect of its medial wall is a depression known as the elliptical recess which accommodates part of the utricular macula.

The spherical recess is a similar depression for the saccular macula, located anteroinferiorly. The vestibular crest, is an oblique elevation between these two recesses. The opening for the cochlea lies anteriorly, while the openings for the semicircular canals are located posteriorly.

The oval window is an opening on the lateral wall, adjoining the tympanic cavity. The vestibular aqueduct with its contained endolymphatic duct opens into the posteroinferior aspect of the vestibule.

THE CANALS:

The osseous semicircular canals are:

- The lateral
- Posterior
- Superior canals

Each canal expands to double its diameter at its osseous ampulla where it communicates with the vestibule. The non ampullated ends of the posterior and superior canals fuse, forming the common crus, while the non

ampullated end of the lateral canal remains independent .Thus, the vestibule has five apertures for the semicircular canals.

THE MEMBRANOUS LABYRINTH:

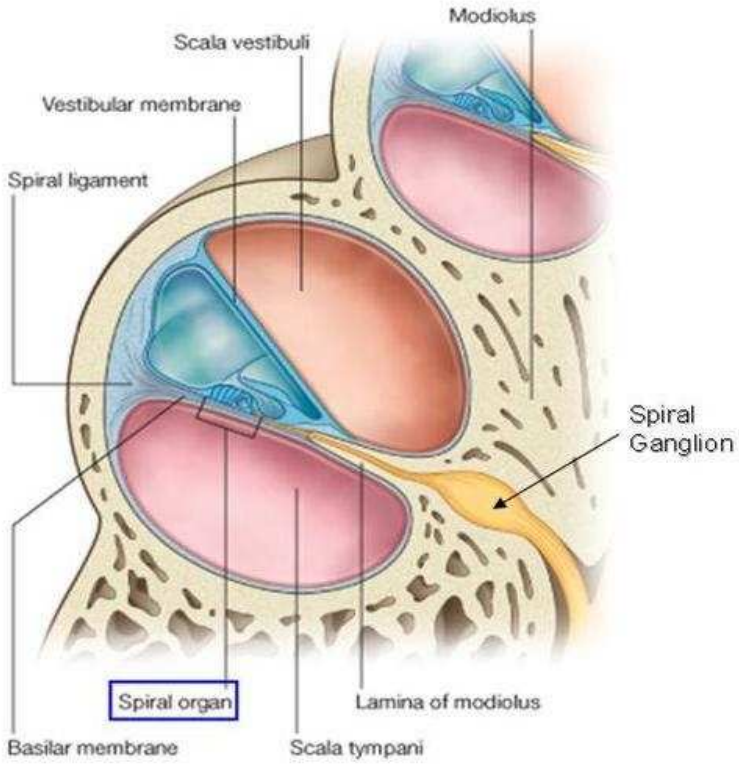
The membranous labyrinth is encased within the bony labyrinth and is surrounded by the perilymphatic space.

The constituents are

- The cochlear duct,
- The three semicircular ducts and their ampullae,
- The otolithic organs (the utricle and saccule), and the endolymphatic (otic) duct and sac.

This system of epithelially lined channels and spaces is filled with endolymph (Scarpa's fluid); the utricular duct, the saccular duct, and the ductus reuniens interconnect the major structures.

COCHLEA



The cochlea is snail shaped and has a spiral configuration with two and a half turns. The center portion of the spiral is called the *modiolus*. The portion of the cochlea that is closest to the oval window is the base, whereas the portion of the cochlea that is farthest away from the oval window is the apex.

The cochlea is having three compartments: scala tympani, scala vestibuli and scala media.

The basilar membrane separates the scala tympani and the scala media, Reissner's membrane separates the scala media and the scala vestibuli The scala tympani and the scala vestibuli communicates with each other at helicotrema.

In the scala media , the organ of Corti rests on the basilar membrane.

Basilar membrane and organ of Corti are referred to as the cochlear partition.

The organ of Corti has the inner and the outer hair cells. .

The inner hair cells are arranged in a single row and outer hair cells are arranged in three rows. These hair cells have hairlike projections called stereocilia, which is responsible for the signal transduction in hair cells.

The scala vestibuli and the scala tympani are filled with perilymph, which resemble the extracellular fluid (high in sodium, low in potassium) in composition. The scala media filled with end lymph, which resemble intracellular fluid (low in sodium, high in potassium) in composition. The electrolyte composition of the scala media causes the *endocochlear potential,* which is +60 to +100 mV relative to the perilymph.

PHYSIOLOGY

The difference between the impedance of air and the impedance of fluid is great; thus, in the transmission of sound energy from Air to Fluid medium, there would be a 99.9% loss which is approximately 30 dB loss. The above loss can be overcome by impedence matching, which allows optimum sound energy transmission.

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HYDRAULIC LEVER

This is the ratio of the surface area of the tympanic membrane to that of the oval window. The tympanic membrane surface area is 55 mm2 and stapes foot plate surface area 3.2 mm2. This difference represents a 17-fold increase in surface area. Sound energy striking the much larger tympanic membrane is transmitted through to a much smaller surface area of the stapes footplate.

LEVER RATIO

The length of the manubrium, when compared the long process of the incus, is 1.3times longer. Hence the leverage gain is 1.3. Combined effects

of these two mechanisms, the Hydrualic ratio and the lever ratio ,the approximate gain is 22 dB .

The Two factors help in the transmission of sound energy are

1. Optimal Eustachian tube Function
2. Gas exchange within the middle ear Mucosa

EUSTACHIAN TUBE

The Eustachian tube has cartilaginous and bony portion. The lateral bony portion of the canal opens in the anterior wall of Middle Ear. The medial cartilaginous part, opens into the nasopharynx and is closed at rest.

The tensor veli palatini opens the Eustachian tube orifice during swallowing, for a transient period that lasts 0.3–0.5s.This results in pressure equalization with the atmospheric pressure

MIDDLE EAR MUCOSAL GAS EXCHANGE

Middle ear mucosa has a well-developed capillary structure close to its surface .This helps in gas exchange In normal conditions middle ear pressure is equal to atmospheric pressure , approximately760 mmHg at sea level.

These gases are bidirectionally exchanged. Nitrogen levels in middle ear gas is higher than that of venous blood. This gradient results in gas exchange between the middle ear space and venous blood.

The absorption of nitrogen into the venous blood results in negative pressure in the middle ear. This is equalized by opening of the Eustachian tube. Prolonged Eustachian tube dysfunction hampers this mechanism results in negative middle ear pressure, transudation of fluid, and the development of a middle ear effusion and increases the middle ear acoustic impedence.

TRANSMISSION OF SOUND ENERGY IN THE COCHLEA

When sound energy travels through the ear, it causes the stapes footplate to vibrate. The vibration of the stapes footplate produces a compressional wave in the perilymph , which travels to the scala vestibuli, through the helicotrema, and out across the scala tympani toward the round window. An inward motion of the stapes results in outward movement of the round window.

When the organ of corti and basilar membrane are deflected in response to the compressional wave, it produces a shearing force between the tectorial membrane and the stereocilia of the hair cells . This shearing

force produces a deflection of stereocilia toward the direction of tallest row results in opening of stretch-sensitive cationic channels located on the stereocilia. The opening of these stretch-sensitive cationic channels causes a influx of cationic current, which results in hair cell depolarization.

When inner hair cells are depolarized, it opens voltage-gated calcium channels. The resulting calcium current triggers neurotransmitter release across the synapse, which results in activation of the auditory nerve fibers.

PATHOLOGY OF CHRONIC OTITIS MEDIA.

Chronic otitis media is a chronic inflammation of the middle ear and mastoid cavity which presents with persistant ear discharge through a tympanic membrane perforation , for a period of more than 3 months .

TYPES OF CHRONIC OTITIS MEDIA .

1. Chronic otitis media mucosal type (tubotympanic).
2. Chronic otitis media squamous type(atticoantral)

STAGES OF COM

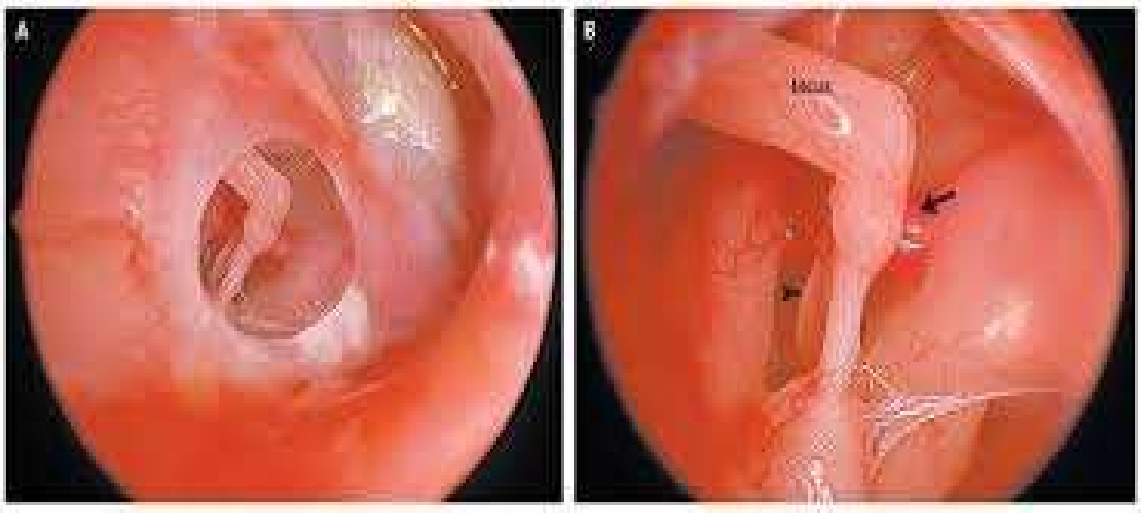
MUCOSAL

1. ACTIVE
2. INACTIVE
3. HEALED

SQUAMOSAL

1. ACTIVE
2. INACTIVE

1.CHRONIC OTITIS MEDIA ACTIVE MUCOSAL TYPE



This is defined as Permanent perforation of Tympanic membrane with inflammatory changes in the middle Ear mucosa and Mastoid and is characterised by mucopurulent discharge and the presence of granulation tissue ,Polpoidal Mucosa ,Polyp, Cholesterol granuloma , ossicular erosion .

HISTOLOGY

Histologic studies have shown that as the inflammatory process enters the chronic phase, there is a shift in cellular population from infiltrating leukocytes towards the mononuclear cells such as macrophages, lymphocytes, and plasma cells.

In chronic inflammation, the mucosa undergoes metaplasia from a single layer of cuboidal epithelium to mucosa resembling that of the respiratory tract with increased numbers of goblet and glandular cells. Consequently, there is an increase in the volume and viscosity of the mucus. Submucosal changes are fibrosis, hypervascularilty, infiltration of lymphocytes, plasma cells and histiocytes .

GRANULATION TISSUE

Granulation tissue consisting of vascular connective tissue with inflammatory infiltrates has been found to be the prominent pathologic feature of COM.As granulation tissue matures, it becomes dense and fibrotic with decreased vascularity. This process leads to scarring and adhesions associated with the ossicular chain and TM. As the inflammation persists, sclerosis, along with new bone formation, can cause a reduction in mastoid And antral pneumatization.

Ossicular erosion

Bone erosion is an important characteristic feature of Active mucosal and Active squamous Chronic Otitis Media. Resorptive osteitis is due to hyperemia with proliferation of capillaries and permanent histiocytes .

Following structures are eroded in descending order of frequency – long process of Incus ,crurae of stapes , body of incus , manubrium of mallelus .

CLINICAL FEATURES

Two hallmark presenting symptoms are

1. otorrhea
2. hearing loss.

The nature of the otorrhea is helpful in describing the specific type of COM. Profuse, intermittent, non foul smelling ,mucoid discharge is commonly noted in chronic otitis media mucosal type. Blood-stained discharge is often noted with granulation tissue or polyps.

The degree of hearing loss will depend on the size and location of the TM perforation and the status of the middle ear. Large perforations will generally cause greater hearing loss compared with smaller defects. In addition, perforations overlying the posterior part of the mesotympanum, and thus the round window niche, usually cause more severe degrees of conductive hearing loss because the TM is no longer protecting the round window membrane from direct sound energy transfer. As a result, there is reduction of the “baffle” effect, leading to a change in the cochlear mechanics. Ossicular chain involvement will also cause conductive hearing loss.

AUDIOMETRIC TESTING

Every initial evaluation for Chronic Otitis Media should include audiometric testing with air and bone pure-tone thresholds.

The degree of hearing loss isoften helpful in determining the extent of the middle ear disease. Perforations of the TM can account for 15 to 20 dB of conductive hearing loss. When perforations are accompanied by ossicular chain damage, the hearing loss can increase to between 30 and 50 dB. **Speech discrimination** testing is also useful. Specifically, speech reception thresholds can help determine whether a patient is a candidate for middle ear reconstructive surgery.

MEDICAL MANAGEMENT

The treatment of COM generally begins with local care of the ear and outpatient medical management. For medical management to be successful, aural toilet is imperative. The main goal is to remove debris from the EAC overlying the TM and middle ear cleft so that topical antimicrobial agents can successfully penetrate to the middle ear mucosa Topical antibiotics particularly fluoroquinolones are used.

The addition of topical corticosteroids in combination with antimicrobial agents improves response rate. The anti-inflammatory properties of corticosteroids are thought to allow increased antibiotic levels in the middle ear mucosa by decreasing tissue edema Medical treatment usually requires 14 to 21 days.

CHRONIC OTITIS MEDIA INACTIVE MUCOSAL TYPE. (Dry perforation).

This is defined Permanent perforation of pars tensa without inflammatory changes in the middle Ear mucosa and Mastoid. Clinical features are only Hearing loss, without active ear discharge. On Otoscopic examination Central perforation with normal Middle ear mucosa is seen.

SURGICAL MANAGEMENT

Myringoplasty-This is done under Local Anaesthesia or General Anaesthesia.

Steps of Myringoplasty ;

1. Harvesting of temporalis fascia.
2. Transcanal exposure

3. Freshening the margins of perforation
4. Canal incisions and elevation of tympanomeatal flap
5. Assessment of ossicular chain
6. Graft placement

HARVESTING OF TEMPORALIS FASCIA

Temporalis fascia is a time tested material with an excellent take up rate because of its low metabolic rate and is available from same incision ,ideal thickness .The fascia is elevated from the underlying temporalis muscle by injecting saline underneath the fascia to facilitate easy removal .

FRESHENING THE MARGINS OF PERFORATION

The margins of perforation are freshened by using sickle knife and the rim is removed by using cup forceps.

ELEVATION OF TYMPANOMEATAL FLAP;

An incision is made in the bony meatal skin, starts at 12 o clock position superiorly and 6 o clock position inferiorly .The tympanomeatal flap is elevated upto fibrous annulus . The middle ear is entered using sickle knife. The handle of malleus is skeletanized .

ASSESSMENT OF OSSICULARCHAIN;

Ossicular continuity has to be assessed.

UNDERLAY TEMPORALIS FASCIA GRAFTING;

Temporalis fascia is placed under the remnant of tympanic membrane with fibrous annulus [underlay technique], and under the handle of malleus.

Underlay technique of grafting has replaced the overlay technique due to

1. Higher chances of lateralization of graft.
2. Anterior blunting
3. Longer healing time
4. Formation of epithelial pearl

Associated with overlay technique.

After grafting tympanomeatal flap is repositioned .gel foam kept around the flap and graft.

CORTICAL MASTOIDECTOMY-

EXPOSURE OF MASTOID CORTEX;

A modified William wilde incision is made along the post auricular groove. Two incisions are made over the subcutaneous tissue with the curvilinear vertical limb along the posterior bony canal wall close to meatal skin and the horizontal incision just above the spine of henle along the linea temporalis. Soft tissue along with periosteum over the mastoid is elevated posteriorly by lemperts periosteal elevator . The cartilaginous canal along

with posterior meatal skin flap is separated from its attachment at spine of henle by lempert periosteal elevator.

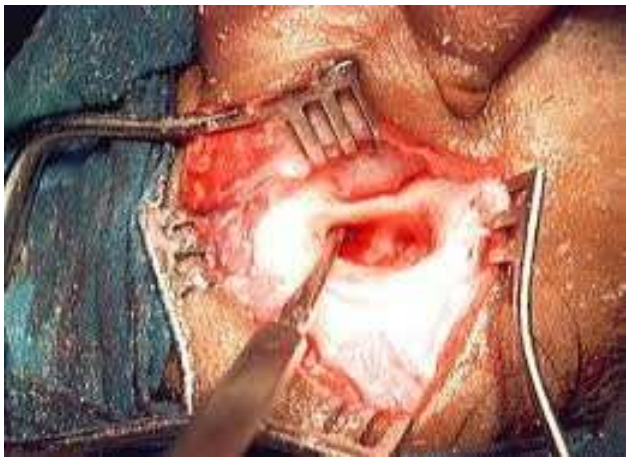
The subcutaneous tissue over the masoid and the posterior meatal skin flap is retracted by Mollison self retaining haemostatic mastoid retractor.

The temporalis muscle with fascia and the subcutaneous tissue at the mastoid tip is retracted by Jenson mastoid retractor.

The important landmarks on the lateral surface of temporal bone are spine of Henle , linea temporalis, and Mac Ewans triangle .

MAC EWANSTRIANGLE;

This is marked by linea temporalis superiorly, postero superior meatal wall anteriorly, a line tangential to posterior canal wall touching the linea temporalis posteriorly.



The initial drilling on mastoid cortex begins with large cutting burr and delineation of three boundaries of mastoid antrum. It includes demarcating the tegmen plate superiorly along the linea temporalis and posterior canal wall anteriorly; The posterior limit of dissection is variable and depends upon the position of lateral sinus.

Occasionally, a partial or complete bony septum called koerner septum may be present in a pneumatised mastoid and it represents the embryonic petrosquamous junction separating the superficial squamous cells and deeper petrosal cells.This plate of bone is penetrated to enter the antrum.

The mastoid antrum is often blocked with polypoidal mucosa. Once the polypoidal mucosa from the antrum is removed lateral semicircular canal, is identified.

The exenteration of mastoid air cells involved by infected polypoidal mucosa, is carried out in a systematic manner which include peritegmen air cells, perisinus air cells, lateral and medial tip cells, sinodural cells and retrolabrynthine cells.

Polypoidal mucosa or granulations blocking the aditus is removed .and the aditus patency checked.

At the end of cortical mastoidectomy all the accessible cells are exenterated and the aditus is cleared of all the polypoidal mucosa.

MATERIALS AND METHODS

MATERIAL

Study Design- Prospective study

Study Place- Department of ENT Stanley Medical College Chennai .

Study Period –Jan 2012 – September 2013

Sample size – 60 patients

Follow up -1 Year .

Inclusion Criteria

- Age 15 -45 years
- Duration of symptoms 1-5 years
- No other foci of sepsis in the nose /paranasal sinus/nasopharynx.
- No previous otological surgery in ear of interest.
- Conductive hearing loss of not more than 40dB.
- Good cochlear function

EXCLUSION CRITERIA:

- Age less than 15years , more than 45 years
- Any foci of sepsis in nose /PNS/nasopharynx
- Previous otological surgery in particular ear of interest
- Conductive hearing loss of more than 40 dB
- Presence of sensorineural hearing loss
- Patient with posterosuperior Retraction or cholesteoma

METHODOLOGY

In our study , 60 patients were selected on the basis of Inclusion criteria from the period between Jan 2012 – September 2013 , and followed up for a period of 1 year

- Both Males and females were taken up for the study
- All patients between age 15 – 45 were taken into study.
- Duration of symptoms between 1-5 years.Symptoms in either of the ear was taken into study.
- Focal sepsis like tonsillitis, Adenoid enlargement, sinusitis were excluded by clinical examination, Diagnostic Nasal Endoscopy and CT Paranasal Sinus before including the patient into the study.

- Patients operated previously for Ear Disease, were not included in this study.
- Patient with posterosuperior Retraction or cholesteoma were not included
- All size of Central perforation of tympanic membrane were included.
- Preoperatively Tuning Fork test and pure tone Audiometry were done.
- Patient with more than 40dB were excluded from the study.
- Patient with sensorineural hearing loss were also excluded from the study.
- Patient with complications of Chronic suppurative otitis media were excluded from the study.

The study was explained to the patient and the consent was taken and need for regular follow -up till 1 year was emphasized.

PREOPERATIVE MANAGEMENT

Patient with ear discharge, ear swab was taken and based on culture and sensitivity report topical Antibiotic Ear drops and Systemic Antibiotics were prescribed.

Mucolytic agents Ambroxol was prescribed .

Treatment was continued till the patient had no ear discharge.

Based on Inclusion and Exclusion criteria , 60 patients were selected for our study ,out of which thirty patient were randomly selected and subjected to Myringoplasty and considered as **Group A** .

Myringoplasty;

Steps ofoperaton.

The procedure was done under either L.A/GA

Temporalis fascia graft was used

Perforation‘s edge was freshened and undermining done.

Tympanomeatal flap is elevated.

The middle ear mucosa, eustachian tube orifice, ossicular chain status, presence of any granulation/cholesteatoma/retraction pocket was examined.

Wash was given using Antibiotic solution.

The graft was placed under the handle of malleus in the entire patient.

tympanomeatal meatal flap is repositioned.

External canal wall is packed with cotton wick soaked in antiseptic ointment.

Post Operatively Regular dressing done, Antibiotics, mucolytics were given for 6weeks.

Patient was advised against taking head bath and cool drinks.

Rest of the Thirty patient were subjected to Cortical mastoidectomy with Type I Tympanoplasty and considered as **Group B** .

CORTICAL MASTOIDECTOMY WITH TYPE I TYMPANOPLASTY.

The procedure was done under either L.A/GA .

Temporalis fascia graft was used in all cases.

Tympanic membrane perforation edge was freshened and undermining done.

Tympanomeatal flap was elevated.

The middle ear mucosa ,eustachian tube orifice ,ossicular chain status , presence of any granulation/cholesteatoma/retraction pocket were examined .

A Modified William Wilde post aural incision was made and subcutaneous tissue,muscles, periosteum are incised and separated.

Spine of Henle, Mac Evans triangle, posterior bony margin of meatus identified. Using a drill, mastoid cortex is removed over Mac Ewans triangle and mastoid antrum is identified and opened. All groups of diseased air cells were removed systematically and cavity edges were saucerized. Patency of aditus is confirmed by saline irrigation.

The graft was placed under the handle of malleus in all the patient .

Tympanomeatal flap is repositioned.

Post aurally wound closed in layers

The external auditory meatus is packed with cotton wick soaked in antiseptic ointment .

Post Operatively regular dressing done , Antibiotics ,mucolytics were given for 6weeks .

Patient was advised against taking head bath and cool drinks .

All patient were followed up at 2months ,6months ,1 year.

Patients were examined clinically and Otoscopic Examination was done .

Graft take up status , presence of ear Discharge were examined .

Hearing was assessed using Tuning Fork test and Pure Tone Audiometry at 6 months and 1year .

1. Hearing Improvement post operatively
2. Graft successfully take up
3. No recurrence of disease

Above parameters were used to determine the successful outcome

STATISTICAL ANALYSIS

The collected data was analysed with SPSS 16.0 version. To describe about the data descriptive statistics frequency analysis, percentage analysis, mean, S.D were used. To find the significance difference between bivariate samples in independent samples(Myringoplasty& Cortical Mastoidectomy) the Independent t-test test & Mann-Whitney U test was used and for the paired samples (Pre OP & Post OP) Paired t-test & Wilcoxon Signed rank test was used.For the repeated measures Fried man test was used.In all the above statistical tools the probability value P=.05 is considered as significant level.

Descriptives

MCM = Myringoplasty

Descriptive Statisticsa

	N	Minimum	Maximum	Mean	S.D
AGE	30	17	45	30.90	8.243
DDY	30	1	4	2.07	.907
Valid N (listwise)	30				

MCM = Cortical Mastoidectomy

Descriptive Statisticsa

	N	Minimum	Maximum	Mean	S.D
AGE	30	17	43	30.63	8.564
DDY	30	1	4	2.03	.890
Valid N (listwise)	30				

Frequencies

MCM = Myringoplasty

Frequency Table

GENDERa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	F	19	63.3	63.3	63.3
	M	11	36.7	36.7	100.0
	Total	30	100.0	100.0	

DISEASE SIDEa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	L	15	50.0	50.0	50.0
	R	15	50.0	50.0	100.0
	Total	30	100.0	100.0	

PERFORATION SIZEa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Large	12	40.0	40.0	40.0
	Small	18	60.0	60.0	100.0
	Total	30	100.0	100.0	

POST2GSa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Graft taken up	25	83.3	83.3	83.3
	Residual Perforation	5	16.7	16.7	100.0
	Total	30	100.0	100.0	

POST2DISa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Discharge	28	93.3	93.3	93.3
	Discharge	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

POST6GSa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Graft taken up	28	93.3	93.3	93.3
	Residual Perforation	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

POST6DISa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Discharge	28	93.3	93.3	93.3
	Discharge	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

POST1GSa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Graft taken up	28	93.3	93.3	93.3
	Residual Perforation	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

POST1DISa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Discharge	28	93.3	93.3	93.3
	Discharge	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

MCM = Cortical Mastoidectomy

Frequency Table

GENDERa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	F	16	53.3	53.3	53.3
	M	14	46.7	46.7	100.0
	Total	30	100.0	100.0	

DISEASESIDEa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	L	15	50.0	50.0	50.0
	R	15	50.0	50.0	100.0
	Total	30	100.0	100.0	

PERFORATIONSIZEa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Large	13	43.3	43.3	43.3
	Small	17	56.7	56.7	100.0
	Total	30	100.0	100.0	

POST2GSa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Graft taken up	26	86.7	86.7	86.7
	Residual Perforation	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

POST2DISa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Discharge	29	96.7	96.7	96.7
	Discharge	1	3.3	3.3	100.0
	Total	30	100.0	100.0	

POST6GSa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Graft taken up	28	93.3	93.3	93.3
	Residual Perforation	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

POST6DISa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Discharge	28	93.3	93.3	93.3
	Discharge	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

POST1GSa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Graft taken up	28	93.3	93.3	93.3
	Residual Perforation	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

POST1DISa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Discharge	28	93.3	93.3	93.3
	Discharge	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

T-Test

MCM =

Myringoplasty

Paired Samples Statisticsa

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	HLPRE	27.83	30	4.086	.746
	HLPOST	18.50	30	5.894	1.076

Paired Samples Testa

Paired Differences			Pair 1
			HLPRE - HLPOST
	Mean		9.333
	Std. Deviation		3.651
	Std. Error Mean		.667
T	95% Confidence Interval of the Difference	Lower	7.970
Df		Upper	10.697
Sig. (2-tailed)			14.000
			29
			.000

MCM = Cortical Mastoidectomy

Paired Samples Statisticsa

Pair 1					
		Mean	N	Std. Deviation	Std. Error Mean
	HLPRE	31.83	30	4.997	.912
	HLPOST	22.17	30	5.032	.919

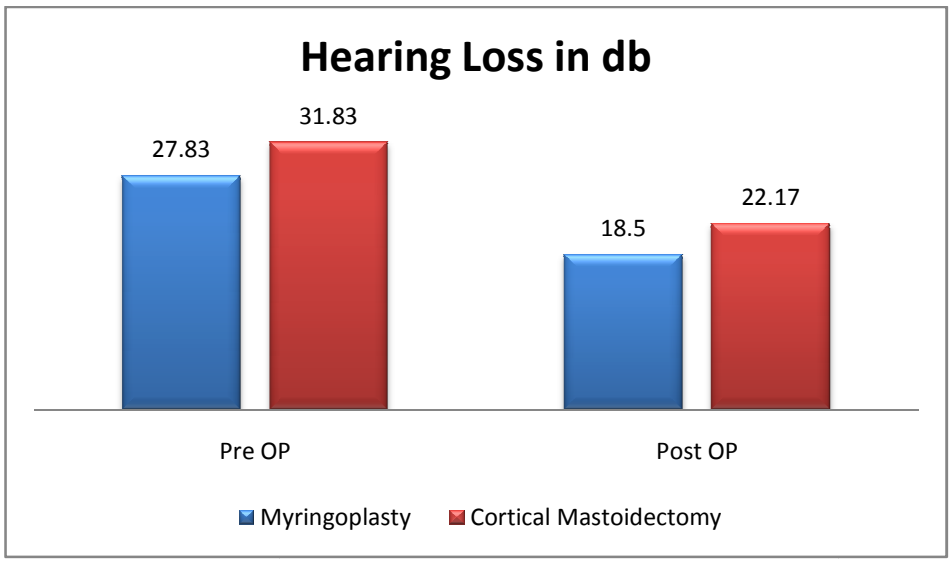
Paired Samples Testa

Paired Differences			Pair 1
			HLPRE - HLPOST
	Mean		9.667
	Std. Deviation		4.536
	Std. Error Mean		.828
T	95% Confidence Interval of the Difference	Lower	7.973
Df		Upper	11.360
Sig. (2-tailed)			11.673
			29
			.000

T-Test

Group Statistics

DDY	MCM	N	Mean	Std. Deviation	Std. Error Mean
HLPRE	Myringoplasty	30	2.07	.907	.166
	Cortical Mastoidectomy	30	2.03	.890	.162
HLPOST	Myringoplasty	30	27.83	4.086	.746
	Cortical Mastoidectomy	30	31.83	4.997	.912
	Myringoplasty	30	18.50	5.894	1.076
	Cortical Mastoidectomy	30	22.17	5.032	.919



Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
DDY	Equal variances assumed	.087	.769	.144	58	.886	.033	.232	-.431	.498
	Equal variances not assumed			.144	57.979	.886	.033	.232	-.431	.498
HLPRE	Equal variances assumed	1.874	.176	-3.394	58	.001	-4.000	1.179	-6.359	-1.641
	Equal variances not assumed			-3.394	55.799	.001	-4.000	1.179	-6.361	-1.639
HLPOST	Equal variances assumed	.279	.600	-2.591	58	.012	-3.667	1.415	-6.499	-.834
	Equal variances not assumed			-2.591	56.606	.012	-3.667	1.415	-6.500	-.833

NPar

Tests

MCM =

Myringoplasty

Friedman Test

Ranksa

	Mean Rank
POST2 GS	2.10
POST6 GS	1.95
POST1 GS	1.95

Test Statisticsa,b

N	30
Chi-Square	6.000
df	2
Asymp. Sig.	.050

MCM = Cortical Mastoidectomy

Friedman Test

Ranksa

	Mean Rank
POST2GS	2.07
POST6GS	1.97
POST1GS	1.97

Test Statisticsa,b

N	30
Chi-Square	4.000
df	2
Asymp. Sig.	.135

NPar

Tests

MCM =

Myringoplasty

Friedman Test

Ranksa

	Mean Rank
POST2 DIS	2.00
POST6 DIS	2.00
POST1 DIS	2.00

Test Statisticsa,b

N	30
Chi-Square	.
df	2
Asymp. Sig.	.

MCM = Cortical Mastoidectomy

Friedman Test

Ranksa

	Mean Rank
POST2 DIS	1.97
POST6 DIS	2.02
POST1 DIS	2.02

Test Statisticsa,b

N	30
Chi-Square	2.000
df	2
Asymp. Sig.	.368

NPar

Tests

MCM =

Myringoplasty

Wilcoxon Signed Ranks

Test

Rankss

		N	Mean Rank	Sum of Ranks
POST6 GS - POST2 GS	Negative Ranks	3	2.00	6.00
	Positive Ranks	0	.00	.00
	Ties	27		
	Total	30		
POST1 GS - POST2 GS	Negative Ranks	3	2.00	6.00
	Positive Ranks	0	.00	.00
	Ties	27		
	Total	30		
POST1	Negative	0	.00	.00

GS - POST6 GS	Ranks			
	Positive Ranks	0	.00	.00
	Ties	30		
	Total	30		
POST6 DIS - POST2 DIS	Negative Ranks	0	.00	.00
	Positive Ranks	0	.00	.00
	Ties	30		
	Total	30		
POST1 DIS - POST2 DIS	Negative Ranks	0	.00	.00
	Positive Ranks	0	.00	.00
	Ties	30		
	Total	30		
POST1 DIS - POST6 DIS	Negative Ranks	0	.00	.00
	Positive Ranks	0	.00	.00
	Ties	30		
	Total	30		

Test Statisticsc,d

	Z	Asymp. Sig. (2-tailed)
POST6GS - POST2GS	-1.732	.083
POST1GS - POST2GS	-1.732	.083
POST1GS - POST6GS	.000	1.000
POST6DIS - POST2DIS	.000	1.000
POST1DIS - POST2DIS	.000	1.000
POST1DIS - POST6DIS	.000	1.000

MCM = Cortical Mastoidectomy

Wilcoxon Signed Ranks Test

Rankss

		N	Mean Rank	Sum of Ranks
POST6GS - POST2GS	Negative Ranks	2	1.50	3.00
	Positive Ranks	0	.00	.00
	Ties	28		
	Total	30		
POST1GS - POST2GS	Negative Ranks	2	1.50	3.00
	Positive Ranks	0	.00	.00
	Ties	28		
	Total	30		
POST1GS - POST6GS	Negative Ranks	0	.00	.00
	Positive Ranks	0	.00	.00
	Ties	30		

	Total	30		
POST6DIS - POST2DIS	Negative Ranks	0	.00	.00
	Positive Ranks	1	1.00	1.00
	Ties	29		
	Total	30		
POST1DIS - POST2DIS	Negative Ranks	0	.00	.00
	Positive Ranks	1	1.00	1.00
	Ties	29		
	Total	30		
POST1DIS - POST6DIS	Negative Ranks	0	.00	.00
	Positive Ranks	0	.00	.00
	Ties	30		
	Total	30		

Test Statisticsd,e

	Z	Asymp. Sig. (2-tailed)
POST6GS - POST2GS	-1.414	.157
POST1GS - POST2GS	-1.414	.157
POST1GS - POST6GS	.000	1.000
POST6DIS - POST2DIS	-1.000	.317
POST1DIS - POST2DIS	-1.000	.317
POST1DIS - POST6DIS	.000	1.000

NPar Tests

Mann-Whitney Test

Ranks

	MCM	N	Mean Rank	Sum of Ranks
POST2GS	Myringoplasty	30	31.00	930.00
	Cortical Mastoidectomy	30	30.00	900.00
	Total	60		
POST2DIS	Myringoplasty	30	31.00	930.00
	Cortical Mastoidectomy	30	30.00	900.00
	Total	60		
POST6GS	Myringoplasty	30	30.50	915.00
	Cortical Mastoidectomy	30	30.50	915.00
	Total	60		
POST6DIS	Myringoplasty	30	30.50	915.00
	Cortical Mastoidectomy	30	30.50	915.00
	Total	60		
POST1GS	Myringoplasty	30	30.50	915.00
	Cortical Mastoidectomy	30	30.50	915.00
	Total	60		
POST1DIS	Myringoplasty	30	30.50	915.00
	Cortical Mastoidectomy	30	30.50	915.00
	Total	60		

Test Statisticsa

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
POST2GS	435.000	900.000	-.359	.720
POST2DIS	435.000	900.000	-.587	.557
POST6GS	450.000	915.000	.000	1.000
POST6DIS	450.000	915.000	.000	1.000
POST1GS	450.000	915.000	.000	1.000
POST1DIS	450.000	915.000	.000	1.000

RESULTS AND OBSERVATION

Totally 60 patients were included in our study.

Out of which 30 patients were randomly selected in Group A and underwent Myringoplasty .

Rest of the patients, were included in Group B , underwent Cortical Mastoidectomy with Type I Tympanoplasty .

PREOPERATIVE STATUS

Group A –

In this group , 19 were Female , 11 were Male patients .

18 patients had small Perforation, while 12patients had Large central perforation of the tympanic membrane.

Pre op Hearing loss in group A – 27.8 dB .

POST OPERATIVE STATUS

GRAFT UPTAKE STATUS

At 2 months,

Graft taken up in 25 patients, 5 patients had residual perforation which corresponds to success rate of 83.3 % of Graft uptake.

At 6 months,

Totally, 28 patients had graft uptake, while only 2 patients had residual perforation which corresponds to success rate of 93.3 % of Graft uptake .

At the end of 1 year,

Totally, 28 patients had graft uptake, while only 2 patients had persistent perforation, which corresponds to success rate of 93.3 % of Graft uptake.

DISCHARGE STATUS

28 patients had no discharge, from 2 months till the end of 1 year.

Only 2 patients, out of 30 patients had persistent discharge, till the end of 1 year , without improvement . Success Rate is 93.3 %.

HEARING STATUS

Preoperatively patient had a average of 27.8 dB of Hearing loss.

Hearing was tested by Pure tone audiometry, which showed, Hearing loss has reduced to 18.5 dB.

So, 9.3dB of Hearing gain has been achieved.

PREOPERATIVE STATUS

Group B –

In this group , 16 were Female , 14 were Male patients .

17 patients had small Perforation, while 13 patients had Large central perforation of the tympanic membrane.

Pre op Hearing loss in group B – 31.83dB.

POSTOPERATIVE STATUS

GRAFT UPTAKE STATUS

At 2 months ,

Graft taken up in 26 patients ,4 patients had residual perforation which corresponds to success rate of 86.7 % of Graft uptake .

At 6 months ,

Totally , 28 patients had graft uptake , while only 2 patients had residual perforation which corresponds to success rate of 93.3 % of Graft uptake .

At the end of 1 year ,

Totally , 28 patients had graft uptake , while only 2 patients had persistent perforation,which corresponds to success rate of 93.3 % of Graft uptake.

DISCHARGE STATUS

29 patients had no discharge ,at 2 months

1 patient had discharge at the end of 2 months.

At the end of 1 year ,only 2 patients ,out of 30 patients had persistent discharge .

Success Rate is 93.3 %.

Hearing status

Preoperatively patient had a average of 31.83 dB of Hearing loss.

Hearing was tested by Pure tone audiometry, which showed, Hearing loss has reduced to 22.17 dB.

So, 9.66 dB of Hearing gain has been achieved.

DISCUSSION

The post operative outcome in Group A patients ,who underwent Myringoplasty and Group B patients ,who underwent Cortical Mastoidectomy has been compared .

Hearing status – In Group A patients, the hearing loss is reduced to 18.5 dB ,from the preoperative hearing loss of 27.8dB .

So the hearing gain is 9.3dB.

In Group B patients , the hearing loss is reduced to 22.1dB ,from the preoperative hearing loss of 31.8dB .

Here , the hearing gain is 9.7dB.

When comparing both the results , the difference of hearing gain between these two surgical procedures ,is insignificant.

Graft uptake status –

In Group A patients ,the graft uptake success rate is 83.3 % at 2months , 93.3 % at 6 months and 1 year .

,In Group B patients ,the graft uptake success rate is 86.7 % at 2months , 93.3 % at 6 months and 1 year .

Statistically , the difference in the outcome is insignificant.

Discharge status –

In Group A, 93.3 % patients had no ear discharge, upto the follow up period of 1 year.

While in Group B patients, same percentage of success rate is seen .

So statistically, there is no difference between these procedures.

Therefore, above results showed that clinically and statistically cortical Mastoidectomy with Type I Tympanoplasty had no added advantage over Myringoplasty in the surgical outcome of active cases of Chronic Otitis Media.

Results of our study are compared with similar studies available in literature.

STUDY 1

Study conducted by Albus,TranbaliniF,Amadori ,Department of otorhinolarynogology , Clauj,Napoca

Romania .

In this study , Total No. of patient – 320

	No . of Cases	Success Rate	Failure Rate
Group A	160	82.8%	17.2%
Group B	160	76%	24%

Group A – Cortical Mastoidectomy with Type I Tympanoplasty

Group B – Myringoplasty

Totally 320 patients were taken for the study , all the patient were in Active mucosal stage of Chronic Otitis media , Graft Take Up and recurrence of discharge were compared . The success rate in Group A was – 82.8%, where as in Group B , it was 76% .

Statistically , the difference is insignificant .

STUDY 2

.The study conducted by Mishiro Y, Kitahara T, Takahashi Y, ,Kajikawa, Sakagami

In this study , Total No. of patient – 251

	No . of Cases	Success Rate	Failure Rate
Group A	147	91%	9%
Group B	104	94%	6%

Group A – Cortical Mastoidectomy with Type I Tympanoplasty
Group B – Myringoplasty

Totally 251 patients were taken for the study , all the patient were in Active mucosal stage of Chronic Otitis media , Graft Take Up and recurrence of discharge were compared . The success rate in Group A was – 91%, where as in Group B , it was 94% .

Statistically , the difference is insignificant .

STUDY 3

The study conducted by Balyan FR, , Asian A, Taibah A, Sanna, Celikkanat S, Russo A,

In this study, Total No. of patient – 81

	No. of Cases	Success Rate	Failure Rate
Group A	28	86%	14%
Group B	53	91%	9%

Group A – Cortical Mastoidectomy with Type I Tympanoplasty

Group B – Myringoplasty

Totally 81 ,patients were taken for the study , all the patient were in Active mucosal stage of Chronic Otitis media , Graft Take Up and recurrence of discharge were compared . The success rate in Group A was – 86%, where as in Group B , it was 91% .

Statistically , the difference is insignificant .

STUDY 4

The study conducted by Bhat K,Hedge J S

NagalotimathKumar ,Naseeruddin

In this study , Total No. of patient – 68

	No . of Cases	Success Rate	Failure Rate
Group A	35	90%	10%
Group B	33	91%	9%

Group A – Cortical Mastoidectomy with Type I Tympanoplasty

Group B – Myringoplasty

Totally 68 ,patients were taken for the study , all the patient were in Active mucosal stage of Chronic Otitis media , Graft Take Up,Hearing Improvement and recurrence of discharge were compared . The success rate in Group A was – 90%, where as in Group B , it was 91% .

Statistically, the difference is insignificant.

The results of the all the above studies , showed that there is no statistically significant difference in the success rate of Graft Uptake ,Hearing Improvement and recurrence Rate between Myringoplasty and Cortical Mastoidectomy with Type I Tympanoplasty .

These results Coincides with our study results that Cortical Mastoidectomy ,doesnot influence much on the success rate of Graft Uptake ,Hearing Improvement and recurrence Rate,when compared with Myringoplasty Alone .

CONCLUSION

In our study, the results prove that in patients with chronic otitis Media ,tubotympanic type ,Active Disease ,

Myringoplasty and cortical Mastoidectomy with type I tympanoplasty ,has similar surgical outcome ,in terms of Hearing gain ,Recurrence of the disease , graft uptake provided that patients are selected carefully.

LIMITATIONS OF THE STUDY

1. Since the Study Group is very small in our study, only approximate statistical inference could be obtained.

2. The period of follow up is short ,so later recurrence could be missed.

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PROFORMA

Case no:

Name : Address:

Age : IP no :

Sex:

Occupation:

Presenting complaints: Side Duration

Ear Discharge

Hard of Hearing

Ear pain

Tinnitus

Giddiness

History of presenting illness

Ear discharge – Side

Duration

Onset

Type

Quantity

Continous/Intermittent

Aggravating /Relieving factor

Hard of hearing

Side

Duration

Onset

Progression

Ear Pain

Side

Duration

Intensity

Aggravating/Relieving Factors

Nasal Complaints

Nasal Block /Nasal Discharge/Headache

Throat Complaints

Throat Pain ,Difficulty in swallowing

Past History

Any previous of Surgery

Any H/o DM /Hypertension /TB/Asthma/CAD/Epilepsy

Any H/o Drug Allergy/Bleeding Diathesis.

Family History:

Any similar illness in the family.

General Physical Examination:

Built /Nutrition /Febrile/Anemia/Jaundice/Cyanosis/generalized

Lymphadenopathy.

Systemic Examination – CVS/RS/PA/CNS

ENT Examination

Examination of the Ear	**Right**	**Left**
Preauricular Region		
Pinna		
Postauricular Region		
External Auditory Canal		

Tympanic Membrane

Middle Ear Status

Tuning Fork tests

Rinnes test

Weber test

Absolute Bone Conduction test

Tragus sign

Fistula test

Three point Mastoid tenderness

Facial Nerve Examination

Examination of Nose

External Nose

Dorsum

Ala

Columella

Anterior Rhinoscopy	**Right**	**Left**
Septum		
Inferior Turbinate		
Inferior Meatus		
Middle Turbinate		
Middle Meatus		
Cottles Test		
Cold spatula Test		
Cotton Wool test		

Paranasal Sinus Tenderness

Examination of Throat

Lips /teeth /gums/Tongue /Hard Palate /

Soft palate/Uvula/Tonsil/Anterior and Posterior Pillar /Posterior pharyngeal Wall .

Provisional Diagnosis

Investigation

1.Pure Tone Auditory

2. X –ray Mastoid

3. Diagnostic Nasal Endoscopy

4.CT PNS

Management

Medical Management

Surgical Management

1. Myringoplasty

2. Cortical Mastoidectomy with Type I Tympanoplasty .

Post operative follow up

	2months	6 months	1 year
Otoscopic Examination			
Tuning Fork Test			
Pure Tone Audiometry			

INSTITUTIONAL ETHICAL COMMITTEE, STANLEY MEDICAL COLLEGE, CHENNAI-1

Title of the Work : Comparative study of cortical mastoidectomy with Myringoplasty Vs Myringoplasty in active cases of Tubotympanic chronic otitis media

Principal Investigator : Dr.M.Siddarthan

Designation : PG in M.S (ENT)

Department : Department of ENT
Government Stanley Medical College,
Chennai-1

The request for an approval from the Institutional Ethical Committee (IEC) was considered on the IEC meeting held on 06.03.2012 at the Council Hall, Stanley Medical College, Chennai-1 at 2PM

The members of the Committee, the secretary and the Chairman are pleased to approve the proposed work mentioned above, submitted by the principal investigator.

The Principal investigator and their team are directed to adhere to the guidelines given below:

1. You should inform the IEC in case of changes in study procedure, site investigator investigation or guide or any other changes.
2. You should not deviate from the area of the work for which you applied for ethical clearance.
3. You should inform the IEC immediately, in case of any adverse events or serious adverse reaction.
4. You should abide to the rules and regulation of the institution(s).
5. You should complete the work within the specified period and if any extension of time is required, you should apply for permission again and do the work.
6. You should submit the summary of the work to the ethical committee on completion of the work.

26/3/12

MEMBER SECRETARY,
IEC, SMC, CHENNAI

ஒப்புதல் படிவம்

எனக்கு காது சவ்வில் ஓட்டை விழுந்து சீழ் வந்து கொண்டிருப்பதால் அறுவை சிகிச்சை செய்ய வேண்டியதன் அவசியம் மருத்துவரால் எடுத்துரைக்கப்பட்டது. அறுவை சிகிக்கையின் போது ஏற்படும் பக்கவிளைவுகளையும் மருத்துவர் மூலம் அறிந்து கொண்டேன். அறுவை சிகிச்சையின் போது ஏற்படும் பக்க விளைவுகளுக்கு மருத்துவரோ மருத்துவமனையோ பொறுப்பல்ல என்பதை உணர்ந்து முழு மனதுடன் அறுவை சிகிச்சைக்கு சம்மதிக்கிறேன்.

இப்படிக்கு

(நோயாளர் பெயர்)

இடம்:

தேதி:

உள் நோயாளி எண்:

நோயாளர் தகவல் படிவம்

ஸ்டேன்லி மருத்துவமனையின் காது, மூக்கு, தொண்டை சிகிச்சை பிரிவில் காதில் சீழ் வடியும் நோய்க்காக அறுவை சிகிச்சையும் அது குறித்து ஆராய்ச்சியும் நடை பெற்றதை அறிந்து கொண்டேன். மேலும் அறுவை சிகிச்சை முடிந்த பின்பு ஒரு வருட காலத்திற்கு தொடர்ந்து கண்காணிப்பில் இருக்க வேண்டியதன் அவசியத்தையும் அறிந்து கொண்டு முழு மனதுடன் இந்த ஆராய்ச்சியில் பங்கு கொள்ள சம்மதிக்கிறேன்.

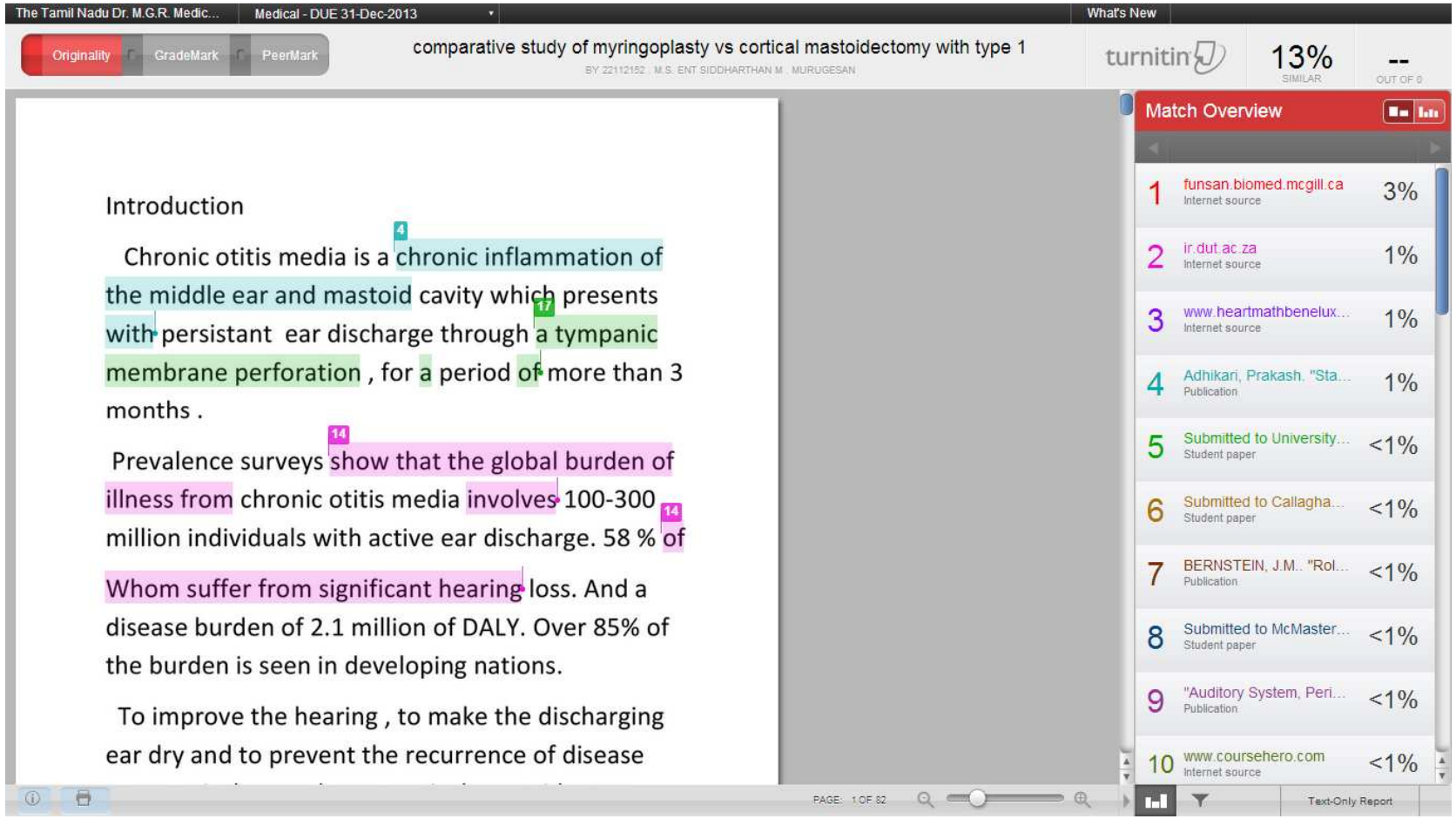
இப்படிக்கு

(நோயாளர் பெயர்)

நாள்:

தேதி:

உள் நோயாளி எண்: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comparative study of myringoplasty vs cortical mastoidectomy with type 1
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Introduction
Chronic otitis media is a chronic inflammation of the middle ear and mastoid cavity which presents with persistant ear discharge through a tympanic membrane perforation , for a period of more than 3 months .
Prevalence surveys show that the global burden of illness from chronic otitis media involves 100-300 million individuals with active ear discharge. 58 % of Whom suffer from significant hearing loss. And a disease burden of 2.1 million of DALY. Over 85% of the burden is seen in developing nations.
To improve the hearing , to make the discharging ear dry and to prevent the recurrence of disease
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Cortical Mastoidectomy

S.No.	NAME	AGE	SEX	Diseased side	disease duration in years	hearing loss (pre-op) in dB	perforation size	Post operative follow-up						hearing loss (post-op)in dB
								2 months		6 months		1 year		
								graft status	discharge	graft status	discharge	graft status	discharge	
1	valarmathy	32	F	L	2	40	large	1	0	1	0	1	0	25
2	Chitra	38	F	R	1	30	Small	1	0	1	0	1	0	15
3	Gowri	33	F	R	3	35	Small	1	0	1	0	1	0	25
4	Murugesan	40	M	R	2	30	large	1	0	1	0	1	0	20
5	Bakyalaxmi	22	F	L	2	35	Small	1	0	1	0	1	0	20
6	Jothi	28	F	L	1	25	Small	1	0	1	0	1	0	15
7	Bhuvaneshwari	20	F	R	2	25	Small	1	0	1	0	1	0	20
8	Megarunnisha	42	F	L	2	40	large	1	0	1	0	1	0	25
9	Kali	40	M	R	3	35	large	1	0	1	0	1	0	25
10	Kasthuri	18	F	R	3	35	large	2	0	1	0	1	0	35
11	Manikam	32	M	L	2	35	Small	1	0	1	0	1	0	25
12	PARPATHSINGH	35	F	R	1	30	Small	1	0	1	0	1	0	20
13	Apthul rahman	27	M	L	1	25	Small	1	0	1	0	1	0	20
14	Selvi	22	F	L	1	25	large	1	0	1	0	1	0	15
15	Rathna	18	F	R	2	30	Small	1	0	1	0	1	0	20
16	Govindhan	34	M	L	3	35	large	1	0	1	0	1	0	25
17	Sowmya	19	F	R	2	30	Small	1	0	1	0	1	0	15
18	Saraswathi	35	F	L	3	40	large	1	0	1	0	1	0	25
19	Nagamma	30	F	L	2	30	large	2	0	2	1	2	1	30
20	Shanmugam	41	M	R	3	35	large	2	0	1	0	1	0	25
21	Baskaran	38	M	L	2	30	Small	1	0	1	0	1	0	25
22	nizamuthin	24	M	R	1	30	Small	1	0	1	0	1	0	25
23	Ezhumalai	39	M	R	4	35	Small	2	1	2	1	2	1	30
24	Ramesh	20	M	L	2	30	Small	1	0	1	0	1	0	15
25	Balachander	31	M	R	1	25	Small	1	0	1	0	1	0	20
26	Saroja	43	F	R	2	35	large	1	0	1	0	1	0	20
27	Dinesh kumar	22	M	L	1	25	Small	1	0	1	0	1	0	20
28	MINNALA	17	F	L	1	25	Small	1	0	1	0	1	0	15
29	Amayadula	42	M	R	4	40	large	1	0	1	0	1	0	25
30	Andiyappan	37	M	L	2	35	Large	1	0	1	0	1	0	25

Graft Status

1 - Graft taken up
2 - Residual Perforation

Discharge

0 - No Discharge
1 - Discharge

Myringoplasty

S.No.	NAME	AGE	SEX	Diseased side	disease duration in years	hearing loss (pre-op) in dB	perforation size	Post operative follow-up						hearing loss (post-op)in dB
								2 months		6 months		1 year		
								graft status	discharge	graft status	discharge	graft status	discharge	
1	surya	17	M	R	1	35	small	1	0	1	0	1	0	20
2	narayammal	40	F	L	3	30	large	1	0	1	0	1	0	20
3	syed ali fathima	45	f	R	3	30	large	1	0	1	0	1	0	15
4	lakhsmi	28	F	R	2	25	small	1	0	1	0	1	0	15
5	Ramya	18	F	L	1	25	small	1	0	1	0	1	0	15
6	Kalpana	23	F	L	2	20	small	1	0	1	0	1	0	10
7	Muthulakshmi	30	F	L	3	35	large	1	0	1	0	1	0	30
8	Noor mohamad	34	M	R	3	35	large	2	1	2	1	2	1	35
9	vasanthi	27	F	L	2	25	Small	1	0	1	0	1	0	15
10	ganga	20	F	L	2	25	Small	1	0	1	0	1	0	20
11	umarani	26	F	R	1	20	Small	1	0	1	0	1	0	10
12	SURESH	29	M	L	1	25	Large	2	0	1	0	1	0	15
13	Periyasamy	40	M	R	2	30	Small	1	0	1	0	1	0	15
14	ablu	20	F	R	2	30	small	1	0	1	0	1	0	20
15	jeyaraj	26	M	L	1	25	small	1	0	1	0	1	0	15
16	Ananthi	22	F	R	1	25	small	1	0	1	0	1	0	10
17	JAYA	37	F	R	3	30	large	1	0	1	0	1	0	20
18	Janaki	42	F	L	4	35	large	2	0	1	0	1	0	25
19	Ramanadhan	44	M	R	3	30	large	2	0	1	0	1	0	20
20	RADHA	33	F	L	1	25	small	1	0	1	0	1	0	20
21	MUTHURAJ	28	M	L	2	25	small	1	0	1	0	1	0	15
22	Raja bhadhar	38	M	L	1	30	large	1	0	1	0	1	0	25
23	Balasubramani	32	M	L	2	25	Small	1	0	1	0	1	0	15
24	Manjula	24	F	R	1	25	Small	1	0	1	0	1	0	15
25	Samsad	30	F	L	2	30	large	2	1	2	1	2	1	25
26	revathy	21	F	R	2	25	small	1	0	1	0	1	0	10
27	chinna ponnu	37	F	R	2	30	Small	1	0	1	0	1	0	
28	Rajammal	40	F	R	3	30	small	1	0	1	0	1	0	25
29	ELUMALAI	35	M	L	2	25	Large	1	0	1	0	1	0	20
30	SRINIVASAN	41	M	R	4	30	Large	1	0	1	0	1	0	20

Graft Status

1 - Graft taken up

2 - Residual Perforation

Discharge

0 - No Discharge

1 - Discharge